

# ELLEN CZAPLINSKI

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## EDUCATION

PH.D. IN SPACE AND PLANETARY SCIENCES

University of Arkansas, Fayetteville, AR • June 2021

Relevant courses: planetary geology, astrobiology, remote sensing,  
GPA: 4.0

BACHELOR OF SCIENCE IN PLANETARY SCIENCE

Purdue University, West Lafayette, IN • May 2016

Concentrations: planetary geology, martian surface geomorphology  
Major GPA: 3.58

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## PUBLICATIONS

**Czaplinski, E. C.**, Harrington, E. M., Bell, S. K., Tolometti, G. D., Farrant, B. E., Bickel, V. T., Honniball, C. I., Martinez, S. N., Rogaski, A., Sargeant, H. M., Kring, D. A. (2021) Geologic Map and Rover Traverses for Human-Assisted Sample Return Missions to the Schrödinger Basin, Lunar Farside. *The Planetary Science Journal*, 2, 51.

[DOI:10.3847/PSJ/abdb34](https://doi.org/10.3847/PSJ/abdb34)

**Czaplinski, E. C.**, Yu. X., Dzurilla, K., Chevrier, V. F. (2020) Experimental Investigation of the Acetylene-Benzene Co-Crystal on Titan, *The Planetary Science Journal*, 1, 76. [DOI:10.3847/PSJ/abbf57](https://doi.org/10.3847/PSJ/abbf57)

**Czaplinski, E. C.**, Gilbertson, W. A., Farnsworth, K. K., Chevrier, V. F. (2019) Experimental Study of Ethylene Evaporites under Titan Conditions. *ACS Earth and Space Chemistry*, 3, 2353-2362.

[DOI:10.1021/acsearthspacechem.9b00204](https://doi.org/10.1021/acsearthspacechem.9b00204)

MacKenzie, S. M. et al., including **Czaplinski, E. C.** (2021) Titan: Earth-like on the Outside, Ocean World on the Inside. *The Planetary Science Journal*, 2, 112. [DOI:10.3847/PSJ/abf7c9](https://doi.org/10.3847/PSJ/abf7c9)

Farnsworth, K. K., Chevrier, V. F., **Czaplinski, E. C.**, Luspay-Kuti, A., Steckloff, J. K., Soderblom, J. M. (2021) Dissolution Kinetics and

Diffusion Coefficients of Nitrogen Gas in Liquid Hydrocarbons under Titan Surface Conditions. *Geochimica et Cosmochimica Acta* (submitted).

Moore, K., Courville, S., Ferguson, S., Schoenfeld, A., Llera, K., Agrawal, R., Buhler, P., Brack, D., Connour, K., **Czaplinski, E.**, DeLuca, M., Deutsch, A., Hammond, N., Kuettel, D., Marusiak, A., Nerozzi, S., Stuart, J., Tarnas, J., Thelen, A., Castillo, J., Smythe, W., Landau, D., Mitchell, K., Budney, C. (2021) Bridge to the stars: A mission concept to an interstellar object, *Planetary and Space Science*, 197, 105137  
[DOI:10.1016/j.pss.2020.105137](https://doi.org/10.1016/j.pss.2020.105137)

Sargeant, H. M., Bickel, V. T., Honniball, C. I., Martinez, S. N., Rogaski, A., Bell, S. K., **Czaplinski, E. C.**, Farrant, B. E., Harrington, E. M., Tolometti, G. D., Kring, D. A. (2020) Using Boulder Tracks as a Tool to Understand the Bearing Capacity of Permanently Shadowed Regions on the Moon. *JGR: Planets*, 125, e2019JE006157.  
[DOI:10.1029/2019JE006157](https://doi.org/10.1029/2019JE006157)

Bickel, V. T., Honniball, C. I., Martinez, S. N., Rogaski, A., Sargeant, H. M., Bell, S. K., **Czaplinski, E. C.**, Farrant, B. E., Harrington, E. M., Tolometti, G. D., Kring, D. A. (2019) Analysis of Lunar Boulder Tracks: Implications for Trafficability of Pyroclastic Deposits. *JGR: Planets*, 124, 1296-1314. [DOI:10.1029/2018JE005876](https://doi.org/10.1029/2018JE005876)

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## EXPERIENCE

NASA POSTDOCTORAL PROGRAM FELLOW -  
 Laboratory Studies of Chemistry on Titan's Surface • JPL • Jan. 2022 – Present

I will be conducting laboratory experiments on Titan's surface materials to further our understanding of kinetics of formation, reactions such as co-crystallization, and habitability. I will be using micro-Raman, IR and UV spectroscopy, and powder XRD to analyze these samples.

NASA AUTONOMOUS ROBOTICS RESEARCH FOR OCEAN WORLDS (ARROW) – **SCIENCE CONSULTANT**  
 February 2020 – present

Provided input to roboticists/engineers regarding the geologic processes, chemical compounds, and surface environments on ocean

worlds such as Europa, Enceladus, and Titan. Assisted with testing Resource Adaptive Software Purpose-Built for Extraordinary Robotic Research Yields – Science Instruments (RASPBERRY – SI) in both virtual and physical ocean worlds testbeds.

#### GRADUATE RESEARCH – TITAN EVAPORITE EXPERIMENTS

University of Arkansas • June 2016 – June 2021

Performed evaporite/co-crystal experiments using hydrocarbons relevant to Titan’s lakes. Analyzed resulting mixtures via FTIR spectroscopy and mass to determine saturation values, evaporation rates, and sample thickness. Proficient in analyzing band depth, band area, peak positions, and phase transitions. Updated/engineered several systems (electronics, cooling, etc.) on the Titan chamber. Implemented a Raman spectrometer into the chamber. Oral presentations at LPSC 2017-2020, Titan Surface Meetings, and DPS 2018-2019. Poster presentations at AGU 2017-2020, Titan After Cassini-Huygens 2019. Awarded the 2017 NASA Earth and Space Sciences Fellowship (NESSF) for this research.

#### JPL PLANETARY SCIENCE SUMMER SEMINAR – PARTICIPANT

NASA Jet Propulsion Laboratory • May – Aug 2019

Helped plan a spacecraft mission concept to study an interstellar object. Determined how to best study object’s molecular composition. Designed spacecraft in mechanical/structures role. Worked directly with JPL Team X mentors and Architecture Team.

#### MARS DESERT RESEARCH STATION – CREW GEOLOGIST

Hanksville, UT • Dec 2018 – Jan 2019

Performed 10 field expeditions in a simulated space suit. Measured and analyzed spectra of geologic samples using a TREK visible/IR portable spectrometer. Observed the Sun using the Musk Observatory. Collected and identified ~100 samples of clay, fluvial, and evaporite minerals.

**EXPLORATION SCIENCE SUMMER INTERN – LUNAR GEOLOGY**

The Lunar and Planetary Institute • May 2018 – Aug 2018

Explored future robotic mission sites in the Schrödinger basin, lunar south pole, farside. Created a geologic map of the SW Schrödinger peak ring. Used geologic map as a guide to design robotic traverses in SW peak ring. Served as a beta tester and implemented improved Lunar Reconnaissance Orbiter imagery for JPL's Moon Trek software for exploring lunar datasets.

**TEACHING ASSISTANT – MICROBIOLOGY**

University of Arkansas • Aug 2016 – May 2017

Taught the lab portion of the course for 2 semesters. Topics taught include: identifying unknown bacteria, preparing various stains (Gram, acid-fast, endospore, capsule), microscopy techniques, aseptic technique, and *Staphylococcus/Streptococcus* identification.

**UNDERGRADUATE RESEARCH – MARTIAN GEOMORPHOLOGY**

Purdue University • Feb 2014 – May 2016

Performed a planet-wide survey of slipface features on Martian dune fields. Categorized slipface features based on morphology. Determined most probable origination environment. Presented research at LPSC 2016 – 2018.

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**AWARDS & OPPORTUNITIES**

NPP (JPL) – Laboratory Studies of Chemistry on Titan's Surface • 2021

Panelist – NASA ROSES panels • 2021, 2022

UArk Women's Giving Circle Award for a new Planetarium (\$15,000) • 2021

Early Career Observer for the Europa Clipper science team meeting • 2020

ICARUS Journal Peer Reviewer • 2020

**Zonta International Amelia Earhart Fellowship • 2020**

Science Org. Committee – Experimental Outer Solar System Workshop • 2020

Student Representative for the UArk Space Center • 2019 – 2020

Senior Division Judge – Northwest AR Regional Science Fair • 2019-2020

Judge – NASA “Name the Rover” contest for Mars 2020 Rover • 2019  
 Hartmann Student Travel Grant – Division for Planetary Sciences • 2019  
 Executive Secretary – NASA ROSES Panel • 2019  
 3 Minute Thesis Runner-Up over Titan research • 2018  
 American Geophysical Union Volunteer Grant/Travel Grant • 2017/2020  
 Arkansas Space Grant Consortium STEM/Minority Grant • Arkansas, 2017, 2021  
**NASA Earth and Space Science Fellowship (Titan research) • 2017**  
 Learning Beyond the Classroom Certificate (Purdue) • 2016  
 Ascarelli Research Scholarship (Purdue) • 2012  
 Presidential Scholarship (Purdue) • 2012

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## CONFERENCE PUBLICATIONS

### First-Authored Abstracts:

- E. **Czaplinski**, X. Yu, K. Dzurilla, V. Chevrier. Experimental Investigation of the Acetylene-Benzene Co-Crystal on Titan. *AGU Fall Meeting 2020*, P067-0004. (Poster)
- E. **Czaplinski**, K. Farnsworth, X. Yu, K. Dzurilla, V. Chevrier. Experimental Study of Evaporites on Titan. *DPS 52*, 408.01D. (Oral – Dissertation Talk)
- E.C. **Czaplinski**, V.F. Chevrier, X. Yu, K. Dzurilla. (2020). Experimental Study of C<sub>2</sub>H<sub>2</sub> Crystal Structure Changes Under Titan Conditions. *LPSC LI*, Abstract #1694. (Oral – cancelled due to the pandemic).
- E.C. **Czaplinski**, W.A. Gilbertson, K.K. Farnsworth, V.F. Chevrier. (2019). Characterizing Evaporites on Titan Using an Experimental Chamber. *EPSC-DPS Joint Meeting*, Abstract #1132. (Oral)
- E.C. **Czaplinski**, W.A. Gilbertson, K.K. Farnsworth, V.F. Chevrier. (2019). Characterizing Evaporites on Titan Using an Experimental Chamber. (2019). *Titan After Cassini Huygens Workshop*. (Poster).
- E.C. **Czaplinski**, K.K. Farnsworth, V.F. Chevrier. (2019). Experimental study of ethylene and benzene evaporites under Titan conditions. *LPSC L*, Abstract #1153. (Oral)
- E.C. **Czaplinski**, C.J. Ahrens, V.F. Chevrier. (2019). Comparative morphologies between dune slope streaks and recurring slope lineae on Mars. *LPSC L*, Abstract #1160. (Poster)

- E. **Czaplinski**, K. Farnsworth, V. Chevrier. (2018). An Experimental Study of Evaporites on Titan. *Experimental Analysis of the Outer Solar System Workshop*. Abstract #3009. (Oral)
- E. **Czaplinski**, K. Farnsworth, V. Chevrier. (2018). Experimental Studies of Benzene and Acetylene Evaporites on Titan. *Titan Surface Meeting, Cornell University*. (Oral)
- E. **Czaplinski**, K. Farnsworth, V. Chevrier. (2017). Experimental simulations of ethylene evaporites on Titan. *AGU*, Abstract #213124. (Poster)
- E. **Czaplinski**, K. Farnsworth, V. Chevrier. (2017). Experimental Simulations of Ethylene Evaporites. *Titan Surface Meeting, MIT*. (Oral)
- E. **Czaplinski**, K. Farnsworth, D. Laxton, V. Chevrier, S. Singh. (2017). Experimental results of evaporite deposits on Titan using a surface simulation chamber. *Titan Through Time IV Workshop, NASA Goddard*. (Oral)
- E. **Czaplinski**, K. Farnsworth, D. Laxton, V. Chevrier, M. Heslar, S. Singh. (2017). Experimental results of evaporite deposits on Titan using a surface simulation chamber. *LPSC XLVIII*, Abstract #1537. (Oral)
- E.C. **Czaplinski**, C.J. Ahrens, B.H.N. Horgan. V. F. Chevrier. (2017). Dune Slipface Feature Morphologies and Their Relationship to Mineralogy. *LPSC XLVIII*, Abstract #2049. (Poster)
- E. **Czaplinski** and B. Horgan. (2016). Constraining the Mechanisms of Slipface Failure on Martian Sand Dunes from a New Global Survey. *LPSC XLVII*, Abstract #2006. (Poster)

### Co-Authored Abstracts:

- E.M. Harrington, S.K. Bell, **E.C. Czaplinski**, B.E. Farrant, G.D. Tolometti, V.T. Bickel, C.I. Honniball, S.N. Martinez, A. Rogaski, H.M. Sargeant, and D.A. Kring. (2021). Proposed human-assisted robotic traverses in the northwest peak ring of the Schrödinger basin. *International Astronautical Congress – 21*, (Upcoming Conference).
- E.M. Harrington, **E.C. Czaplinski**, S.K. Bell, G.D. Tolometti, B.E. Farrant, V.T. Bickel, C.I. Honniball, S.N. Martinez, A. Rogaski, H.M. Sargeant, and D.A. Kring. (2021). Geologic Map of a Segment of the Schrödinger Peak Ring and Potential Rover Traverses. *NASA Exploration Science Forum*, (Upcoming Conference).
- G.D. Tolometti, V.T. Bickel, **E.C. Czaplinski**, and H.M. Sargeant. (2020). Using Temperature Constraints to Identify Potentially Traversable Permanently

- Shadowed Regions at the Lunar South Pole. *NASA Exploration Science Forum*, NESF2020-073. (Poster)
- V.T. Bickel, C.I. Honniball, S.N. Martinez, A. Rogaski, H.M. Sargeant, S.K. Bell, **E.C. Czaplinski**, B.E. Farrant, E.M. Harrington, G.D. Tolometti, and D.A. Kring. (2019). Analysis of Lunar Boulder Tracks: Implications for Rover Mobility on Pyroclastic Deposits. (2019). *LPSC L*, Abstract #1587. (Poster)
- K. Farnsworth, V. Chevrier, **E. Czaplinski**, and J.M. Soderblom. (2019). Freezing Points of Methane-Ethane-Nitrogen Mixtures under Titan Surface Pressure. *LPSC L*, Abstract #2672 (Oral)
- K. Farnsworth, J.M. Soderblom, S. Rodriguez, **E. Czaplinski**, and V. Chevrier. (2019). Constraining Ethane Concentration in Titan's Lakes and Seas. *LPSC L*, Abstract #1488 (Poster)
- B.E. Farrant, S.K. Bell, **E.C. Czaplinski**, E.M. Harrington, G.D. Tolometti, V.T. Bickel, C.I. Honniball, S.N. Martinez, A. Rogaski, H.M. Sargeant, and D.A. Kring. (2019). Geologic Map and Potential Rover Traverses for Human-Assisted Sample Return Missions to the Schrödinger Basin, Lunar Farside. *LPSC L*, Abstract #1790. (Poster)
- H.M. Sargeant, V.T. Bickel, C.I. Honniball, S.N. Martinez, A. Rogaski, S.K. Bell, **E.C. Czaplinski**, B.E. Farrant, E.M. Harrington, G.D. Tolometti, and D.A. Kring. (2019). Determining the Bearing Capacity of Permanently Shadowed Regions of the Moon Using Boulder Tracks. *LPSC L*, Abstract #1792. (Oral)
- K. Farnsworth, Z. McMahon, D. Laxton, **E. Czaplinski**, V. Chevrier, A. Luspay-Kuti, and S. Singh. (2017). Experimental Study of Nitrogen Dissolution in Methane-Ethane Mixtures under Titan Surface Conditions. *LPSC XLVIII*, Abstract #1932. (Poster)
- M. Heslar, K. Farnsworth, V. Chevrier, **E. Czaplinski**, and D. Laxton. (2017). Simulations of Titan Lakes: Potential Methane-Ethylene Evaporitic Deposits. *LPSC XLVIII*, Abstract #2657. (Oral)
- S. Singh, T. McCord, J-P. Combe, G. Singh, K. Farnsworth, D. Laxton, E. Czaplinski, and V.F. Chevrier. (2017). Impact of Acetylene and Tholins Mixtures on 1.55  $\mu\text{m}$  Absorption Band. *LPSC XLVIII*, Abstract #2951 (Poster)

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## EXTRACURRICULARS

SPACE HOGS, ASTRONOMY OUTREACH GROUP – V.P.  
University of Arkansas • Aug 2018 – December 2021

Present space science educational lectures to ~2,000 people a year from the community. Travel to local community groups to present mobile planetarium shows. Run hands-on space science activities for K-12 students. Lead a successful fundraising campaign to purchase a new, mobile StarLab planetarium. Awarded a \$15,000 grant from UArk Women's Giving Circle towards the new planetarium.

#### ROCK CLIMBING

Feb 2017 – Present

ATC, GriGri, and Lead climbing/belaying certified. Climbed the height of El Capitan during Feb 2019 and Feb 2020. Outdoor expeditions in AK, AR, AZ, WA.

#### PURDUE BANDS AND ORCHESTRAS - **PERCUSSION**

Purdue University • 2013 – 2016

Marched snare drum. Proficient in various concert percussion instruments in the Wind Ensemble, Percussion Ensemble, and Orchestra.